

ABSTRACT

5 A method of improvement of toughness of a heat
affected zone in a multi-layer welded joint, a fillet
welded joint, and a one-pass or several-pass large heat
input welded joint of a steel plate is provided, that is,
a method of improvement of toughness of a heat affected
zone in a welded joint of a steel plate characterized
10 subjecting a surface of a heat affected zone formed by a
last pass of a multi-layer welded joint of a steel plate
to impacts by an ultrasonic vibration tool or shot
peening by ultrasonic vibration steel balls to thereby
make an average of longitudinal axis of crystal grains up
to a depth of 2 mm or more from the surface of the steel
15 plate in the microstructure adjacent to a fusion line
(FL) of a weld metal and a steel plate matrix in said
heat affected zone formed by the last pass the equivalent
of the crystal grain size of the steel plate matrix
before the welding at a depth of $1/4$ of a thickness t
20 from the surface of the steel plate.